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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/931,686 | 08/16/2001 | Stephan Appen | MUH-11671 | 3318 |

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| EXAMINER |
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PATEL, PARESH H

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| ART UNIT | PAPER NUMBER |
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2829

DATE MAILED: 01/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,686

Applicant(s)

APPEN ET AL.

Examiner

Paresh Patel

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. The declaration filed on 10/08/2003 under 37 CFR 1.131 is sufficient to overcome the Nishikawa (US PAT. 6411079) reference.
2. Applicant's arguments with respect to claims 1-12 and 14-19 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-12 and 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between a test adapter and the contact pins. From the disclosure it is clear that contact pins are used to test the test adapters. But, claimed apparatus failed to disclose the relationship between the contact pins and test adapter and therefore it is indefinite.

Dependent claims are also rejected because they depend from rejected claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 6, 8, 10 and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishikawa (US 6356093).

Regarding claim 1, Nishikawa discloses: An apparatus for automated testing [fig. 12-13], calibration and characterization of test adapters for semiconductor devices, comprising:

a holder [5, 6, 51] for holding a test adapter [2 or PCB];
at least one probe head [141A-B of 4U] adjustably disposed relative to said holder, said probe head having at least two contact pins [142 of 141A-B] with an adjustable spacing distance there between [adj. spacing between 142 of 141A and 141B using 145]; and
an adjustment device[71-75, 143 and using 141AX-Z and 141BXX-Z] configured to adjust said probe head relative to said holder.

Regarding claim 2, Nishikawa discloses: The apparatus according to claim 1, wherein said at least one probe head is one of a plurality of probe heads [141A-B of 4D].

Regarding claim 3, Nishikawa discloses: The apparatus according to claim 1, wherein said probe head is movably disposed in elevation perpendicularly to a surface of said holder [see fig. 12-13].

Regarding claim 4, Nishikawa discloses: The apparatus according to claim 1, wherein said adjustment device is a robot arm [143, 141F and 141AX-Z] and said probe head is mounted on said robot arm [via 141AX-Z].

Regarding claim 6, Nishikawa discloses the holder is configured to hold test adapters with different diameters [inherent to variety of types of circuit board 2 as further defined at lines 26-29 of column 11].

Regarding claim 8, Nishikawa discloses: The apparatus according to claim 1, which comprises a control device [71, 73 and lines 66-61 of column 11] connected for controlling a distance between said contact pins.

Regarding claim 10, Nishikawa discloses: The apparatus according to claim 1, wherein the test adapter is a test card [2].

Regarding claim 17, Nishikawa discloses: The apparatus according to claim 1, wherein said holder is configured to be rotatable or movable [in y-direction using 63, 62, 62, 61, 6 and 5] with respect to said adjustment device.

Regarding claim 18, Nishikawa discloses: The apparatus according to claim 1, wherein said probe head is adjustable within a coordinate system selected from the

group consisting of a polar coordinate system and a cartesian coordinate system
[inherent to program stored in ROM of CPU and CAD].

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa as applied to claim 1 above, and further in view of Deckert et al. (US 6137303).

Regarding claim 5, Nishikawa discloses all the elements including a control device [71 and 73] to control a position of said probe head and the holder. Nishikawa does not disclose said control device [71, 73] controls **a rotation** of said holder. Rather, Nishikawa's control device [71 and 73] controls the movement of the holder in Y direction. Deckert et al. (hereafter Deckert) in fig.1 discloses **control device [25, 24, 20] to control a rotation** [see arrows in fig. 2] of a holder [21,23,32]. It would have been an obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Nishikawa with rotational holder and control device as taught by Deckert, so the testing device (wafer or DUT) of the holder can controllably moved between different stations (e.g. testing, inspecting, marking) during test device (semiconductor or wafer or DUT) test operating process as taught by Deckert.

Regarding claim 7, Nishikawa discloses all the elements except for stepping motor. However, Nishikawa discloses motor 63 but silent about stepping nature of it. Deckert discloses stepping motor [132, 133 (not shown), lines 7-18 of column 9] to position heads 26, 27 over the wafer. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the motor of Nishikawa with stepper motor as taught by Deckert, in order to rotate the holder with microscopic tolerances, in micron sized increments, in the horizontal plane with said probe heads during test operating process.

Regarding claim 9, Nishikawa discloses: The apparatus according to claim 7, which comprises a control device [71 and lines 34-41 of column 7] connected to said stepping motor [71 and lines 1-8 of column 5] and wherein said stepping motor is controlled by said control device.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa as applied to claim 1 above, and further in view of Vinson et al. (PCT/GB98/03262).

Regarding claim 11, Nishikawa discloses all the elements including the test adapter is formed with a number of contact surfaces [contacts of 2] one behind the other in a radial direction of the test adapter. Nishikawa does not disclose said **probe head has a number of said contact pins corresponding to the number of contact surfaces on the test adapter**. Vinson et al. (hereinafter Vinson) discloses probe head [10] has a number of said contact pins [probe of fig. 2-4 with different arrangement as shown in fig. 5-7] corresponding to the number of contact surfaces on the test adapter.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify apparatus of Nishikawa with probes of Vinson, in order to reduce testing time of each test adapter (or DUT), thereby increasing throughput.

10. Claims 12 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa et al. as applied to claim 1 above, and further in view of Vinh (US 5952843).

Regarding claims 12 and 14, Nishikawa discloses all the elements except for **said contact pins are formed with pointed ends (claim 12), are spring-biased contact pins (claim 14).**

Vinh in fig. 1A-B discloses **contact pins [1] are formed with pointed ends [7, lines 15-17 of column 8] and are spring-biased contact pins [1].**

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the pins of Nishikawa as taught by Vinh, in order to ensure good electrical contact with circuit under test (wafer or DUT) by providing pre-determined stress-strain profile from the shape of the spring of the probe pin.

Regarding claim 15, Vinh discloses **contact pins have a profile defining the spring-biased configuration [end of 2 towards 4] thereof.**

Regarding claim 16, Vinh discloses **contact pins have a separate spring [5 or 9].**

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa as applied to claim 1 above, and further in view of Barker (GB 2 240 435 A).

Regarding claim 19, Nishikawa discloses all the elements except for an interface board disposed relative to said holder and opposite to said probe head, said interface board having contact pins configured to contact contact surfaces on the test adapter. Barker in fig. 3-4 discloses an interface board [10] with a contact pins [11] to contact contact surfaces on the test adapter [15]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Nishikawa with interface board of Barker, in order to make electrical contact between probe head and test equipment (ATE) during testing of test adapter (or interface fixture used for testing PCB).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paresh Patel whose telephone number is 703-306-5859 or 571-272-1968. The examiner can normally be reached on 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233 or 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Paresh Patel
Jan. 08, 2004

